

Electro-Voice®
a gulton company

Model PL4 Miniature Electret Condenser Omnidirectional Microphone

SPECIFICATIONS

Element:
Electret condenser

Frequency Response
(see Figure 3):
80-15,000 Hz

Impedance:
150 ohms nominal (balanced)

Polar Pattern:
Omnidirectional

Output Level:
-45 dB ref
(0 dB = 1mW/10 dynes/cm²)
4.36 mV/Pascal @ 1 kHz

S/N Ratio:
72 dB A weighted

Dynamic Range:
117 dB
(141 dB input-open circuit)

Equivalent Noise Level:
Less than 24 dB re
.0002 dyne/cm²

Maximum SPL at 1% THD:
141 dB (SPL) at 1 kHz

Operating Voltage:
9 Vdc internal "transistor radio"
battery (Not supplied. See
Replacement Guide.)
18-50 V dc phantom power

Current Required:
3.9 mA maximum

Output Cable:
2.44 meters (8 feet), two-conductor,
shielded, black, rubber-jacketed,
with TA3F and A3M connectors

Case Material,

Mike Capsule:
Brass

Electronic Housing:
Aluminum

Power-Supply/Buffer:
Steel with plastic cover

Connections:

See Figure 4

Dimensions:

See Figure 1

Finish,

Mike Capsule/Electronic Housing
Assembly:

Non-reflecting grey

Power-Supply/Buffer Assembly:
Nickel plated with black plastic cover

Weight,

Mike Capsule/Electronic Housing
Assembly:

19 grams

Power-Supply/Buffer Assembly:
120 grams (less battery)

Furnished Accessories:

385 windscreens

Belt clip

Storage pouch

Instrument mounting clip

Optional Accessories:

522 extension miniature
interconnect cable, 10 ft long
AC24M power supply
CO94*

*The CO94 is a field replacement for
the microphone capsule electronics and
cable.

DESCRIPTION AND APPLICATIONS

The model PL4 is a miniature, omnidirectional condenser microphone packaged with power supply/module, instrument mounting clip, and microphone cable. The PL4 was developed to be used by the professional musician with the desire to provide accurate, high quality sound reinforcement for acoustic instruments. The microphone and instrument clip's small physical size is ideal for on-stage, in-studio, or on-camera use. The PL4's frequency response is tailored to provide a full range, well balanced sound character with ultra low distortion for clean and accurate sound reproduction (see Figure 3).

An important feature of the PL4 is the buffered second-order bass cut-off active filter housed inside the power supply/module. This filter cuts off energy below 80 Hz reducing undesirable sounds such as rumble or wind noise.

The PL4 is supplied with a specially designed instrument mounting clip and power supply/module. The instrument mounting clip (see Figure 2) clasps onto the sound hole on an acoustic instrument or is attached onto the bell of a horn. The clip's pads are made of a soft elastomer which will not harm the surface of the instrument. The instrument mounting clip allows the musician to position the microphone for obtaining the best sound character of the individual instrument.

The microphone element is attached to the power supply/module by a 6-foot (1.8-meter)

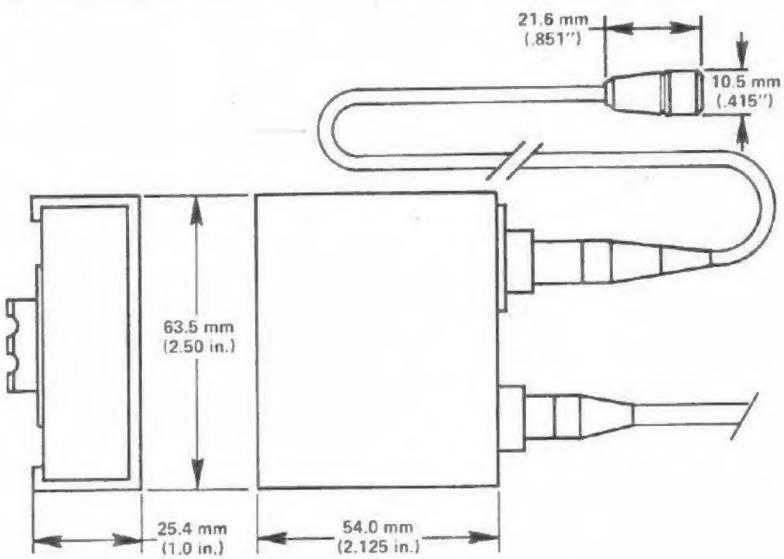


FIGURE 1 — Dimensions

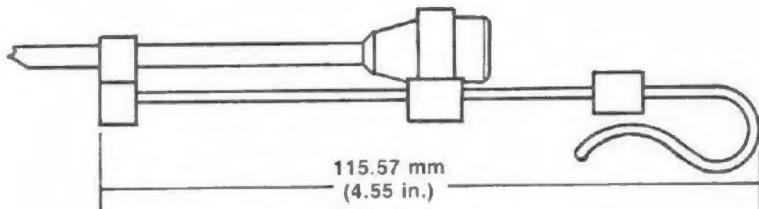


FIGURE 2
Instrument Mounting Clip

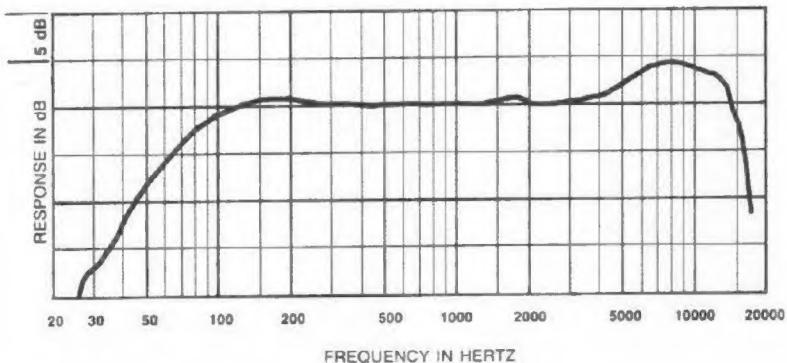


FIGURE 3
Frequency Response

length of durable miniature cable. This cable is connected to the power supply/buffer module with a miniature connector permitting the use of cable extensions. The power supply/buffer is normally clipped to the user's belt utilizing the attached clip.

The PL4 has superior dynamic range, greater than the typical electret lavaliers utilized in an instrumental application. A PL4 is typically 10 dB greater in sensitivity than conventional electret lavaliers and will accept 20 dB greater input SPL before overload. Due to the PL4's superior signal-to-noise ratio and headroom, the microphone can be used in demanding recording and sound reinforcement applications where other miniature lavalier electrets would fail.

POWERING THE PL4

The PL4 can be powered in several ways depending, of course, on the application. The PL4 will operate from a 9-volt battery located in the power supply/buffer module. In this mode, the switch located on the power supply/buffer module's front surface functions as an "on-off" switch.

The PL4 can also operate on any of the currently used phantom power systems employing voltages from 18 to 50 volts d.c. (The series resistances should maintain the required 3.9 mA.) When operating the PL4 in the phantom mode, the switch located on the power supply/buffer module's front surface functions as a silent muting switch (see Figure 4).

If desired the PL4 can be operated in a dual mode employing both battery and phantom powering. The advantage of this configuration is the insurance against loss of signal should the phantom power fail. When phantom voltage is present, the battery is deactivated; however, should the phantom voltage fail, the battery will automatically power the power supply/buffer module. A shorted battery or a shortened phantom supply (assuming the short is to ground and not across the output leads) will not affect the operation of the PL4 on the remaining power source.

OPERATING INSTRUCTIONS

To prepare the PL4 for operation in the battery mode, first slide the black cover forward and then install a fresh 9-volt battery in the exposed compartment. Slide the cover rearward until a slight click is felt. Plug the microphone element assembly into the power supply/buffer module. (An extension cable up to 25 feet long can be used, if desired.) Plug the output cable into the connector on the power supply/buffer module front panel. Slide the switch to the "ON" position. The PL4 should now operate properly. If the PL4 should fail to operate check the battery voltage and verify the seating of the connectors.

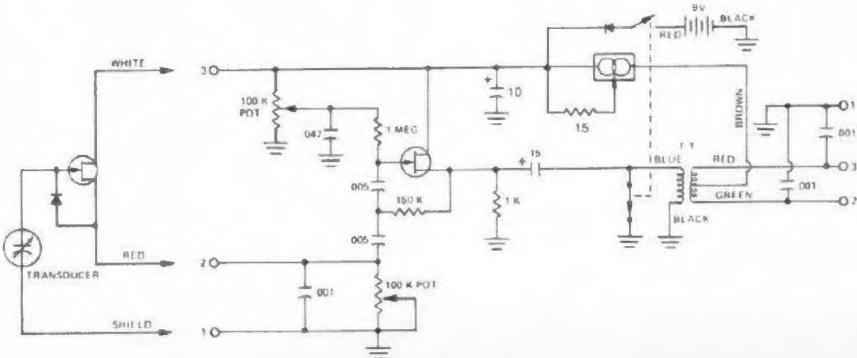


FIGURE 4
Wiring Diagram

PHANTOM POWERED OPERATION

To prepare the PL4 for phantom powered operation, plug the microphone element and output cables into the power supply/buffer module. Slide the front panel switch on the power supply/buffer module to the "ON" position. If the output cable is connected to equipment providing phantom power, the unit will operate properly. If correct operation does not occur, check the phantom power supply source.

MICROPHONE MOUNTING INSTRUCTIONS

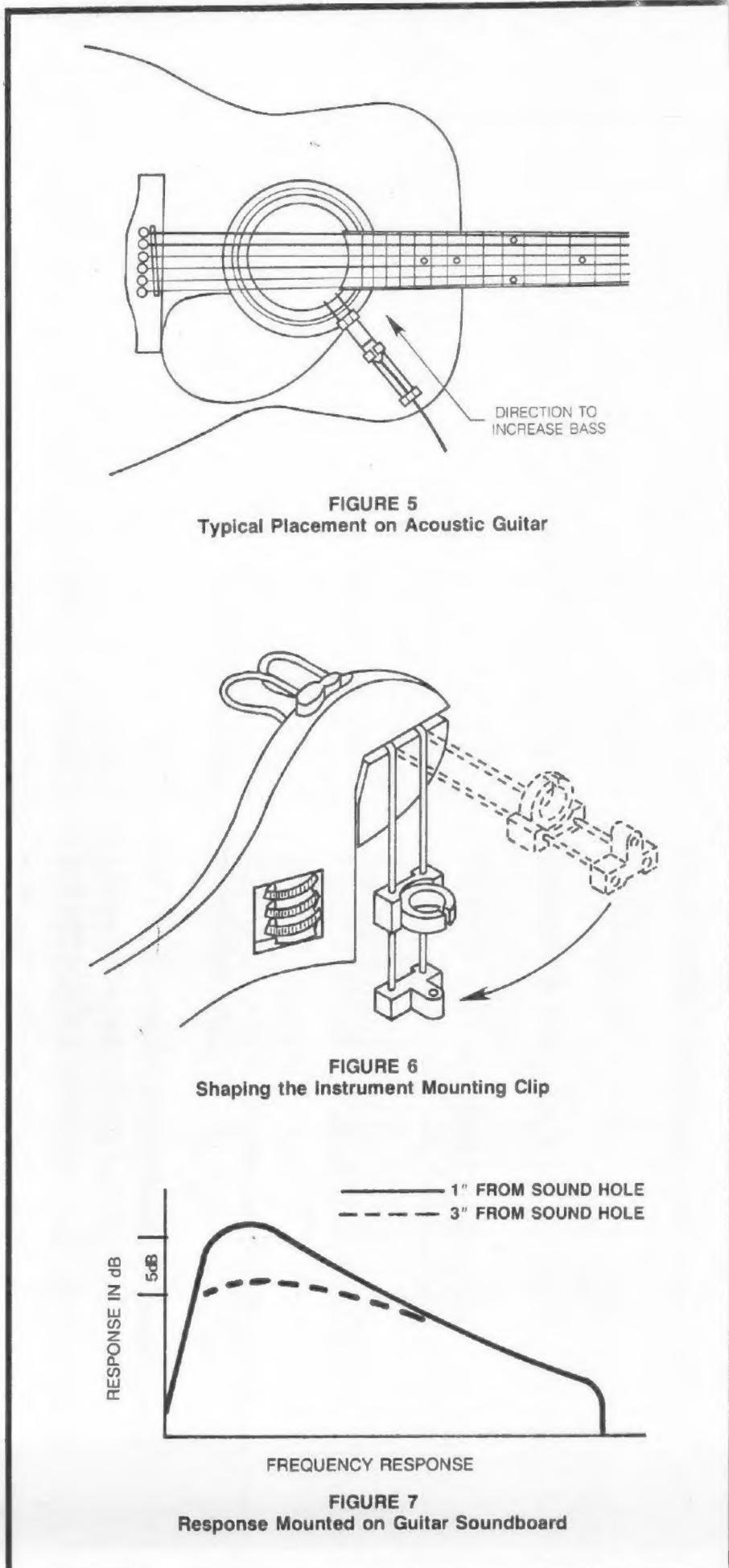
The instrument mounting clip is constructed of a stainless steel wire form with protective plastic sleeving, elastomer microphone mount and pressure pad. The rear pressure pad incorporates a cable strain relief. This strain relief allows the performer to dress the cable out of harms way. The instrument clip is designed to be positioned on any instrument with an acoustic sound hole and is preset to clamp to the average guitar soundboard thickness (see Figure 5). To clip onto the bell of a horn instrument the clip must be bent to clamp onto the more complex, thinner surface.

The instrument clip can be fashioned to locate the microphone at a position on the instrument which is found to be sonically pleasing. The following steps will help in shaping the instrument clip for the particular instrument (see Figure 6 for illustration):

- First: By experimentation find the location on the instrument which is the most sonically pleasing.
- Second: Determine how the clip is to be bent to position the microphone.
- Third: Utilizing a tool with parallel, unserrated jaws, clamp the wires then shape the clamp to form the appropriate angle.

To demonstrate the versatility and provide direction to the user for mounting the PL4 instrument microphone, a series of engineering tests were conducted. The tests consisted of positioning the microphone on a guitar at different distances from the sound hole (see Figure 5). An Ovation guitar, model 1112-4, was tuned open G (tuned to DGDGBD) and played unfretted. The output of the microphone was analyzed by a FFT analyzer (Fast Fourier Transform). The FFT analyzer displays the amplitude and frequency response of a complex signal. Referring to Figure 7, notice that by moving the PL4 closer to the sound hole the bass energy raises at a faster rate than the mid or treble frequencies. Positioning the microphone further from the sound hole will reduce the low frequency energy.

The microphone placement illustrated was selected only to demonstrate what can be



achieved by experimentation. PL4 users are encouraged to experiment with different microphone placements or multiple microphone placement. Undoubtedly that unique microphone placement will be discovered which is pleasing to the style and quality of the instrument.

TECHNICAL INFORMATION:

The PL4 can be separated into three major assemblies: The microphone element assembly, the power supply/buffer assembly, and the instrument clamp assembly. In a similar fashion the microphone element assembly can be divided into two subassemblies: the microphone capsule subassembly and the electronics and cable subassembly. The microphone capsule houses the omnidirectional electret condenser element. The capacitance of this element changes in response to sound pressure variations occurring at the diaphragm. These changes in capacitance are converted to a usable output voltage by the electronics subassembly. Electrical connection to the electronics subassembly is accomplished through a probe which extends from the electronics assembly into a recess on the back of the microphone capsule.

The microphone/electronics assembly is connected to the power supply/buffer assembly via a TA-3M connector. The power supply/buffer houses the electronic circuitry that provides three functions to operate the PL4. The first circuit is the buffer circuitry that interfaces the microphone element to the

BATTERY REPLACEMENT GUIDE:			
Manufacturer	Alkaline	Mercury	Carbon-Zinc
Mallory	MN1604	TR146X	M1604
Eveready	522	E146X	215
Burgess	2NG	H146X	2U6
NEDA	1604A	1604M	1604

mixer console. The second, the high-pass filter, is a 12 dB-per-octave active filter which provides bass roll-off. The designed break frequency for the filter is 80 Hz. The third circuit is the power supply which supplies either battery or phantom voltage to power the microphone.

WARRANTY (Limited)

Electro-Voice Professional, PL & BK Series Microphones (excluding the Model PL88)* are guaranteed against malfunction from any cause for a period of two years from date of original purchase. Also, these microphones (excluding the Model PL88)* are guaranteed without time limit against malfunction in the acoustic system due to defects in workmanship and materials. Any active electronics incorporated in the microphone are guaranteed for three years from date of original purchase for parts and labor against such malfunction. If such malfunction occurs, microphone will be repaired or replaced (at our option) without charge for materials or labor if delivered prepaid to the proper Electro-Voice service facility. Unit will be returned prepaid. Warranty does not extend

to finish, appearance items, cables, cable connectors, switches, or malfunction due to abuse or operation under other than specified conditions, nor does it extend to incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you. Repair by other than Electro-Voice or its authorized warranty service agencies will void this guarantee. A list of authorized warranty service centers is available from Electro-Voice, Inc., 600 Cecil Street, Buchanan, MI 49107 (AC/616-695-6831); Electro-Voice, Inc., 3810 148th Avenue, N.E., Redmond, WA 98052 (AC/206-881-9555) and/or Electro-Voice West, 8234 Doe Avenue, Visalia, CA 93291 (AC/209-651-7777). This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

*The Model PL88 is guaranteed for two years from date of original purchase against malfunction due to defects in workmanship and materials.

Service and repair address for this product: Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107.

Specifications subject to change without notice.



ELECTRO-VOICE, INC., 600 Cecil Street, Buchanan, Michigan 49107

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Part Number 530565-523